ACCIDENT REPORT

Date of Accident: September 3, 1999 **File No.:** H490

Location: West Palm Beach, Fl

Type of Aircraft: Beech King Air B90
Registration No.: N338AS
Serial No.: LJ493

Operator: CP Horizons Corp.
5300 West Atlantic Ave., suite 400
Delray Beach, FL 33484-8165

Aircraft Damage: destroyed

Injuries:
POB: 8
Fatal: 8

Comments:

Night flight from Pontiac, MI to Boca Raton, FL, 1050 miles. The flight departed 1.5 hours late. Weather report indicates a headwind for the first ½ of the flight and 10 to 12 knot tailwinds for the last half. 5 miles from W. Palm Beach Airport the pilot asked to change his destination to W. Palm Beach International. Pilot reported MAYDAY while on approach. Fuel exhaustion is clearly the probable cause.

There was some confusion initially because the FAA incorrectly reported the aircraft's departure time.

The owner, a doctor (experienced but not rated in the aircraft) was in the right seat.

The aircraft was purchased 3 months prior to the accident, operational for only two months.

NTSB IIC is Ron Price, Washington, D.C.

PROPELLER TEARDOWN REPORT

Date: December 7/8, 1999

Location: Pratt & Whitney
Montreal, Quebec

Propeller Model: HC-B3TN-3 with T10173-8 blades

Type Aircraft: Beech King Air B90

Date of Accident: September 3, 1999

Representatives:		
	Tom McCreary	Hartzell Propeller Inc.
	Tom Berthe	Pratt & Whitney
	Denis Deroy	TSB Canada
	Harold Barrentine	Raytheon Aircraft

General Comments:

The aircraft was reported to have crashed at relatively low speed on final approach. It hit a building, power line, dumpster, fence, trees, and ground.

In the "as received" condition, the blades had been cut off for shipping. The propellers were installed on the engines and the spinner domes were installed.

This type propeller is a 3-bladed single acting, hydraulically operated constant speed model with full feathering and reversing capabilities. Oil pressure from the primary propeller governor is used to move the blades to the low pitch (blade angle) direction. Blade mounted counterweights and feathering springs actuate the blades towards the high pitch direction in the absence of governor oil pressure. The blades are of aluminum construction. The hub and blade clamps are steel.
Propeller rotation is clockwise as viewed from the rear.

Installation Data: (Data reference the 30 inch station)

Flight idle:	20.2	± 0.2	degrees
Reverse:	-11.0	± 0.5	degrees
Feather:	87.0	± 0.5	degrees

Service History:

No information concerning the propeller service history was available. The left propeller had a decal that indicated that it had been serviced by Palm Beach Propeller (Lantana, FL). There was no information on the right propeller.

	S/N	Date of manufacture	TTSN	TSO
Left Hub	BUA19506	11/4/96	unknown	unknown
Blades	C84980A	3/27/75		
	D1754A	11/17/75		
	C84302A	3/27/75		
Right Hub	BU10988	12/20/79	unknown	unknown
Blades	H12314	5/8/89		
	H12170	5/8/89		
	H13118	5/8/89		

Propeller Position: LEFT

Hub Serial Number: BUA19506 **Factory No.:** A8564A

Blade Model: T10173-8

S/N 1: C84980A
S/N 2: D1754A
S/N 3: C84302A

Blade Orientation:

1-2-3 counter-clockwise as viewed from the rear of the propeller. The hub serial number was between the # 3 and # 1 blades.

Spinner Dome:

The spinner was dented and "die formed" over the propeller. The dome was formed over the blade clamps and counterweights while the blades were on a low blade angle position (counterweight in 11:00 position relative to centerline @ 12:00 – 6:00 position) (see photo 3, 4).

Spinner Bulkhead: (S/N: U1962)

The spinner bulkhead was dented on the outside diameter (photo 8,9).

Propeller Cycling:

Not possible.

Engine/Propeller Mounting:

Intact and unremarkable (photo 39).

Blade/Clamp Rotation:

None of the blades had rotated in the clamp (photo 6, 7, 8).

Pitch Change Mechanism:

Feather Stops:

Intact and unremarkable. There were light marks on the inside of the piston, but these are typical of normal operation.

Reverse Stops:

Intact and unremarkable.

Piston:

There was a linear mark inside the piston. The mark extended from 2-11/32 inch to 3-23/32 inch from the end of the piston (photo 42, 43). This equates to blade angles in the range of approximately 19° to 62°.
There was also a circumferential mark inside the piston that was 2-4/32 inch from the end. This equates to a blade angle of approximately 12°.

Link Arms:

Link arms # 1 and # 3 were unremarkable. Link arm # 2 was bent in compression.
Two of the link screws (on the blade clamp) had made impact marks on the guide collar (photo 16, 17, 18).

Cylinder:

The cylinder had slight compressive deformation (photo 16).

Feathering Spring Assembly:

The feathering spring assembly was intact and undamaged except for a fractured sleeve in the front spring retainer cup (a common finding in accident props) (photo 60).

Pitch Change Rod:

The pitch change rod was intact and unremarkable.

Clamps and Counterweights:

The clamps, counterweights, and link screws were intact and unremarkable.

Clamp serial numbers:
1: V8887
2: V8666
3: V8903

Hub Unit:

The mounting flange was intact and unremarkable.

The cylinder remained attached to the hub.

Blades:

All three blades had impression marks on the blade butts caused by contact with the hub (next to the hub pilot tube)(photo 19, 20, 21). However, there were no markings that could be used to establish a blade angle.

All three blades had been cut in half to facilitate shipment.

1 blade was bent aft and twisted toward low pitch at mid-blade. There was rotational scoring in the paint on the flat side. It had nicks in the leading edge and the trailing edge was damaged (wavy) (photo 23, 26, 28, 30, 35, 37, 38).

2 blade was bent forward (outer 1/3 of blade). The blade had damage to the trailing edge that was wavy and symmetrical (possible cable impact). It had rotational scoring on the camber side. It had a large dent on the leading edge at mid-blade. It had lengthwise scratches on the flat side near the tip (photo 27, 31, 33, 36, 37, 38).

3 blade had fire damage, soot. It had lengthwise tearing at the trailing edge of the tip. It had a large dent on the trailing edge about 10 inches from the tip (photo 25, 29, 32, 34, 37, 38).

Propeller Position: RIGHT

Hub Serial Number: BU10988 **Factory No.:** 87241

Blade Model:

S/N 1: H12314
S/N 2: H12170
S/N 3: H13118

Blade Orientation:

1-2-3 counter-clockwise as viewed from the rear of the propeller. The hub serial number was between the # 2 and # 3 blades.

Spinner Dome:

The spinner dome had several impact marks from the blade clamps and counterweights.

On blade # 1, two screw heads from the balance weight on the clamp left an impression mark on the spinner dome. These marks were made when the blade was in extreme low pitch blade angle (lower than the reverse pitch stop, but also this blade had disconnected from the clamp and, as received, was in the extreme reverse pitch position) (photo 48).

On blades # 2 and # 3, there were impact marks from the blade counterweights that occurred when the blades were at a low blade angle (angle not measured) (photo 47, 49).

Spinner Bulkhead: (S/N: U1961)

The spinner bulkhead and filler plates were dented but generally intact (photo 52, 53).

Propeller Cycling:

Not possible.

Engine/Propeller Mounting:

Intact and unremarkable.

Blade/Clamp Rotation:

Blade #1 had rotated toward high pitch in its blade clamp, approximately 45° (photo 53).

Blade # 2 did not rotate in its clamp (photo 51).

Blade # 3 rotated about 10° toward low pitch (photo 52).

Since blade # 1 rotated toward low pitch and blade # 3 rotated towards high pitch, it indicates that there were multiple impact forces in differing directions.

Pitch Change Mechanism:

Feather Stop and Reverse Pitch Stop:

Both pitch stops were intact and did not have any signs of hard impact.

Piston:

The piston had one light circumferential mark at 2-4/32 form the end. This mark equates to approximately a 12° blade angle (photo 59).

Link Arms:

On blade # 1, the link screw (in the blade clamp) was missing, clamp threads damaged. The link screw hole in the link arm was elongated (photo 61, 62, 63).

The other two link arms were intact and unremarkable.

There were impression marks on the guide collar caused by link screw contact from all three blades (photo 56, 57, 58). This occurs at extreme reverse pitch position, lower than the reverse pitch stop.

Cylinder:

The cylinder did not show signs of deformation. It did not have any markings that could be used to estimate a blade angle.

Feathering Spring Assembly:

The feathering spring assembly was intact and undamaged except for a fractured sleeve in the front spring retainer cup (a common finding in accident props) (photo 60).

Pitch Change Rod:

Intact and unremarkable (photo 60).

Clamps and Counterweights:

1 blade clamp had a sweeping score mark on the bottom side of the counterweight caused by contact with the link arm (photo 61). This clamp also had the link screw stripped out. The linkscrew was missing.
The other two blade clamps were intact and unremarkable (photo 62, 63).

Clamp serial numbers:
1: H8310
2: EH8318
3: EH6861

Hub Unit:

Mounting flange and cylinder attachment were intact and unremarkable.

There were no useful impact marks created by contact with the blade butts.

Blades:

All three blades had been cut in half to facilitate shipment.

All three blades had impression marks on the blade butts caused by contact with the hub (next to the hub pilot tube)(photo 64, 65, 66). However, there were no butt-end markings that could be used to establish a blade angle.

All three blades were bent, but none had angular twisting (photo 72, 74, 75, 76).

1 blade was bent forward at about 1/3 radius. It had a piece missing from the leading edge, about 3 inches X 1 inch, 11.5 to 15 in from the tip (photo 69, 70). It had a chordwise tear 1.5 inch long in the trailing edge, 10.5 inches from the tip.

2 blade was bent aft at mid-blade. It had a deep cut on the leading edge at mid-blade, about 1.5 inches long. It had abrasion on the leading edge on the camber side. The abrasion was at 45° to the chord (photo 70, 71, 72).

3 blade was bent aft at mid-blade. It had paint scoring on the camber side with rotational score marks (photo 70, 71, 72).